WHAT IS CLAIMED IS:

1. A semiconductor laser device comprising an InP substrate and a multi-layered structure formed on the InP substrate, wherein

the multi-layered structure includes at least a plurality of active regions for outputting a laser beam, and

the plurality of active regions each are provided in each of a plurality of grooves dented toward the InP substrate.

2. A semiconductor laser device according to claim 1, wherein the cross-sectional shape of each of the plurality of grooves is a triangle dented toward the InP substrate.

3. A semiconductor laser device according to claim 1, wherein the plurality of active regions is made of InAsP.

4. A semiconductor laser device according to claim 1, wherein the active regions are formed in a periodic pattern in a direction parallel to the resonator length direction.

5. A semiconductor laser device according to claim 1, further comprising:

an InP layer; and

a light confinement layer made of a semiconductor having a bandgap energy between the bandgap energy of a semiconductor constituting the active regions and the bandgap energy of InP,

wherein the active regions are provided between the light confinement layer and the InP layer.

6. A semiconductor laser device according to claim 1, further comprising a light confinement layer made of a semiconductor having a bandgap energy between the bandgap energy of a semiconductor constituting the active regions and the bandgap energy of InP,

wherein the active regions are surrounded by the light confinement layer.

7. A semiconductor laser device according to claim 5, wherein the light confinement layer is made of InGaAsP.

8. A semiconductor laser device according to claim 6, wherein the light confinement layer is made of InGaAsP.

9. A semiconductor laser device according to claim 1, wherein the active regions each has a multiquantum well structure.

10. A semiconductor laser device according to claim 9, wherein a well layer of the multiquantum well structure is made of InAsP.

11. A semiconductor laser device according to claim 9, wherein a barrier layer of the multiquantum well structure is made of InP.

12. A semiconductor laser device according to claim 1, wherein the active regions each has a size such that a quantum size effect is obtained.

13. A semiconductor laser device according to claim 1, wherein the pitch of the active regions is a multiple of

(1/(2×neff)) by a factor of any integer, where neff is the effective refractive index of the multi-layered structure with respect to an oscillation wavelength.

14. A method for fabricating a semiconductor laser device comprising steps of:

forming a plurality of grooves in a surface of an InP layer;

thermally treating the InP layer in an atmosphere including at least a gas containing phosphorus and a gas containing arsenic in a mixed state, thereby forming a plurality of active regions made of InAsP in the plurality of grooves.

15. A method for fabricating a semiconductor laser device according to claim 14, wherein each of the grooves is formed in a triangle shape such that a bottom of the triangle is on a surface of the InP layer.

16. A method for fabricating a semiconductor laser device according to claim 14, wherein the InP layer is an uppermost layer of a multi-layered structure.

17. A method for fabricating a semiconductor laser device according to claim 16, further comprising a step of forming a light confinement layer adjacent to the InP layer, wherein the light confinement layer made of a semiconductor having a bandgap energy between the bandgap energy of a semiconductor constituting the active regions between the InP substrate and the InP layer and the bandgap energy of InP.

18. A method for fabricating a semiconductor laser device

according to claim 14, wherein the step of thermally treating the InP layer includes a step of intermittently providing a gas containing arsenic, thereby forming a plurality of active regions each having a well layer made of InAsP in the plurality of grooves.

19. A method for fabricating a semiconductor laser device according to claim 16, wherein the step of thermally treating the InP layer includes a step of intermittently providing a gas containing arsenic, thereby forming a plurality of active regions each having a well layer made of InAsP in the plurality of grooves.

20. A method for fabricating a semiconductor laser device according to claim 19, comprising a step of forming a light confinement layer adjacent to the InP layer, wherein the light confinement layer made of a semiconductor having a bandgap energy between the bandgap energy of a semiconductor constituting the active regions between the InP substrate and the InP layer and the bandgap energy of InP.

21. A method for fabricating a semiconductor laser device according to claim 17, wherein the light confinement layer is made of InGaAsP.

22. A method for fabricating a semiconductor laser device according to claim 19, wherein the light confinement layer is made of InGaAsP.

23. A method for fabricating a semiconductor laser device according to claim 13, wherein the plurality of grooves have a periodic pattern in a direction parallel to a resonator length direction.